Patent claims

1. Method for grinding the exterior circumference of a rotating roller (6), held at its ends, with a rotating grinding wheel (13), whereby the length of said roller (6) is a multiple of the width of said grinding wheel, characterized in that during grinding at least one cushioned body (15, 23, 26, 34, 39, 40, 41) made of an elastic solid material or an elastic exterior skin filled with an elastic pressure material is positioned in the circumferential region opposite said grinding wheel (13) against said roller (6) to be ground.

2. Method in accordance with claim 1, characterized in that it is performed as longitudinal grinding, whereby said rotating grinding wheel (13) and said rotating roller (6) are moved relative to one another in the longitudinal direction of said roller (6) against its exterior circumference.

3. Method in accordance with claim 2, characterized in that said roller (6) is rough-ground and finish-ground successively in a single instance of chucking, each with a ceramic-bound CBN grinding wheel (12,13) and said cushioned body (6) [sic] is used at least during re-grinding.

4. Method in accordance with any of the preceding claims, characterized in that

said cushioned body (15) is positioned elastically flexible against said roller (6).

5. Method in accordance with any of the preceding claims, characterized in that the positioning force with which said cushioned body (15) is positioned against said roller (6) is adjustable and can even equal a value of 0 prior to the beginning of the grinding process.

6. Method in accordance with any of the preceding claims, characterized by pneumatic positioning of said cushioned body (15) against said roller (6).

7. Method in accordance with any of the preceding claims, characterized in that at least one cushioned body is positioned during grinding at a location that remains the same in the longitudinal extension of said roller.

8. Method in accordance with any of the preceding claims, characterized in that said at least one cushioned body (15) and said roller (6) are moved relative to one another parallel to the longitudinal direction of said roller (6) during the grinding process.

9. Method in accordance with claim 8, characterized in that said cushioned body

(15) is moved radially essentially opposite said grinding wheel (13) with this relative to said roller (6).

10. Method in accordance with any of the preceding claims, characterized in that said flexible cushioned body (15, 23, 26, 34) conforms to the cylindrical contour of said roller (6) when positioned against it.

11. Method in accordance with claim 10, characterized in that this conforming occurs in that a pressure medium, in particular a gas, acts on the exterior skin of said cushioned body (23, 26, 34) positioned against said wheel (6) to be ground.

12. Method in accordance with any of the preceding claims, characterized in that a liquid or gaseous lubricant is fed to the location at which said flexible cushioned body (26, 34) is positioned against said roller (6).

13. Method in accordance with claim 12 referring back to claim 11, characterized in that said lubricant is formed by said pressure medium of said cushioned body (34) and fed to the position location through apertures (35) that are situated in the exterior skin of said cushioned body (34) facing said roller (6).

14. Method in accordance with any of the preceding claims, characterized in that said cushioned body is adjusted transverse to said roller such that said roller bends outward during the grinding process and due to the grinding in its final state said roller has a longitudinal contour with a slightly concave or convex curve.

15. Method in accordance with any of the preceding claims, characterized in that the positioning force of said at least one cushioned body is changed during the grinding process and/or is adjusted to different values for a plurality of cushioned bodies (39, 40, 41).

16. Method in accordance with claim 15, characterized in that the change in the positioning force occurs depending on the axial region of said roller on which said grinding wheel and/or said cushioned body are acting at that moment.

17. Apparatus for external grinding of rollers (6), in particular for performing the method in accordance with claims 1 through 16, with tension and drive members for chucking said roller (6) at its end faces and for rotationally driving said roller (6) with at least one grinding spindle (11), driving a grinding wheel (13), that can be driven in a direction running transverse to the longitudinal axis of said roller (6) so that said grinding wheel (13) can be

positioned against said roller (6), with drives for mutual longitudinal displacement of roller (6) and grinding wheel (13), and with at least one device (14) that is situated in a circumferential region of said roller (6) opposite said grinding wheel (13), through which device a cushioned body (15, 23, 26, 34, 39, 40, 41) made of an elastic solid material or an elastic exterior skin filled with an elastic pressure medium can likewise be positioned transverse to the longitudinal direction of said roller (6) against its circumference.

18. Apparatus in accordance with claim 17, characterized by a control arrangement for setting the positioning force with which said cushioned body (15) is positioned against the circumference of said roller (6) to be ground.

19. Apparatus in accordance with claim 18 with a plurality of flexible cushioned bodies (39, 40, 41) arranged along said roller (6) to be ground, characterized in that the positioning force of each cushioned body (39, 40, 41) can be adjusted individually and independent of said other cushioned bodies.

20. Apparatus in accordance with claim 18 or 19, characterized in that said device for positioning said flexible cushioned body (15) includes a double-acting pneumatic sliding cylinder (17) at the piston rod (19) of which said cushioned

body (15) is attached.

21. Apparatus in accordance with claim 20 with a plurality of cushioned bodies (39, 40, 41) arranged along said roller (6) to be ground, characterized in that each pneumatic sliding cylinder is allocated a discrete pressure regulator (44, 45, 46).

22 Apparatus in accordance with any of claims 17 through 21, characterized in that said elastic pressure medium is compressed air.

23. Apparatus in accordance with any of claims 17 through 22, characterized in that feed lines are provided that open in the region of the location where said cushioned body is positioned against said roller through which a lubricant is fed to this location.

24. Apparatus in accordance with claim 23, characterized in that grinding emulsions, synthetic coolants, grinding oils, or gas, in particular compressed air, are provided as lubricants.

25. Apparatus in accordance with claim 23, or 24, characterized in that the feed lines conducting said lubricant pass through said cushioned body directly to

the location where said cushion is positioned against said roller.

26. Apparatus in accordance with claim 25, with a cushioned body (26) made of an elastic exterior skin that is filled with an elastic pressure medium, characterized in that said feed lines that pass through said cushioned body (26) and forward lubricant are embodied as tubes (30) that are integral with the elastic external skin of said cushioned body (26), whereby said lubricant and said pressure medium are separated from one another.

27. Apparatus in accordance with claim 26, characterized in that the elastic exterior skin of said flexible cushion (34) is provided at its positioning surface facing said roller (6) to be ground with a plurality of apertures through which said pressure medium passes to the positioning location to form said cooling and lubricating film at this location.

28. Apparatus in accordance with any of claims 17 through 27, characterized in that a grinding headstock (8) is provided with two grinding spindles (10, 11) that can be selectively brought into the work position and of which said first (10) carries a ceramic-bound CBN grinding wheel (12) for rough-grinding and said second carries a ceramic-bound CBN grinding wheel (13) for finish-grinding, and in that an automatic coupling is provided through which said at

least one device for positioning said flexible cushioned body (15) against said wheel (6) to be ground is activated when said second grinding wheel (11) is brought into the work position.